

# OCR Computer Science A Level

## 2.1.2 Thinking Ahead

Flashcards



# What is the purpose of thinking ahead?



# What is the purpose of thinking ahead?

To make programs easy and intuitive for users to use.



# Define inputs.



Define inputs.

Any data that is required to solve a problem, usually entered into the system by the user.



# Define outputs.



Define outputs.

The results that are passed back once the inputs have been processed and the problem solved.



What three considerations do programmers need to make regarding inputs and outputs when thinking ahead?





What three considerations do programmers need to make about inputs and outputs when thinking ahead?

- Method of input/output (device used)
- Data structures used
- Data types used
- Order of data



Identify the inputs and outputs that are likely to be used in a book reservation system i.e. at a library.



Identify the inputs and outputs that are likely to be used in a book reservation system i.e. at a library.

| Inputs                                      | Outputs                         |
|---|---------------------------------|
| Book details: name, author                  | Expected waiting time           |
| ISBN  | Confirmation                    |
| Borrower details: name, library card number | Availability at other libraries |
| Collection point                            |                                 |



# What are preconditions?



# What are preconditions?

Requirements which must be met before a program can be executed.



# Where can preconditions be defined?



# Where can preconditions be defined?

Within the code or within documentation.



Give an example where preconditions  
are required.





Give an example where preconditions are required.

- **Stack functions**

- Check that a stack is not empty when popping an element from a stack
- Check that a stack is not full when pushing an element onto a stack

- **Factorial function**

- The number passed to the function cannot be negative



State two advantages of including preconditions within the documentation accompanying a subroutine.



State two advantages of including preconditions within the documentation accompanying a subroutine.

- Reduces the length of the program
- Reduces the complexity of the program
- Saves time needed to debug and maintain a longer program
- Makes subroutine more reusable



*A Level only*

Define caching.



# Define caching.

The process of storing instructions or values in cache memory after they have been used, as they may be used again.



*A Level only*

# How is caching used in storing web pages?



# How is caching used in storing web pages?

Web pages that a user frequently accesses are cached, so the next time one of these pages is accessed, content can be loaded without any delay.



*A Level only*

# What are the advantages of caching web pages?





# What are the advantages of caching web pages?

- Content can be loaded without delay
- Images and text do not have to be downloaded again multiple times
- Frees bandwidth for other tasks on a network
- Less time is spent waiting



What is the name given to the technique in which instructions are fetched based on algorithms which predict which instructions are likely to soon be used?



What is the name given to the technique in which algorithms are used to predict which instructions are likely to soon be used?

Prefetching



*A Level only*

Give a limitation of caching.



# Give a limitation of caching.

- Accuracy of the algorithms used
- Effectiveness of algorithm in managing the cache
- Size of the cache



Give three advantages of using reusable program components.



# Give three advantages of using reusable program components.

- More reliable than new components, as they have already been tested.
- As developing from scratch is not required, this saves time, money and resources.



Give two examples of reusable program components.





Give two examples of reusable program components.

- Abstract data structures eg. queues and stacks
- Classes
- Subroutines

